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International Preliminary Examination Report

**CLAIMS**

1. Pressure sensor comprising an optical wave guide (10, 52, 76) and a first reflecting element (14, 56, 78) formed in a portion (12, 54, 74) of this optical wave guide, this portion being submitted to pressure (P), this sensor being characterised in that it also comprises means (20, 62, 72) of lateral support of the portion of optical wave guide, and in that this portion of optical wave guide is submitted to a compression prestress with a small value compared with the measurement range of the sensor and in that the sensor also comprises a housing (2, 48) and a membrane (4, 50) that is subjected to pressure and closes this housing, the sensor acting in compression, the portion (12) of the optical wave guide is placed in the housing and comprises first and second ends that are fixed to the membrane and to the housing respectively, and the means of lateral support comprising means (20, 62) of preventing buckling of the portion of optical wave guide when the latter is compressed.

2. Sensor according to claim 1, in which the means (20) of preventing buckling of the portion of optical wave guide comprise a tube (22), which is placed in the housing, and surrounds this portion of optical wave guide and comprises a first end that is at a spacing from the membrane and a second end that is fixed to the housing, and rings (24) which are arranged one after the other in the tube between the housing and the membrane, and are spaced from each other by elastic elements (26), the portion of optical wave guide

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passing through them, and this portion of optical wave  
guide being free to slide in these rings.

3. Sensor according to claim 2, in which  
the elastic elements are elastic toric spacers (26).

5 4. Sensor according to any one of claims 2  
and 3, in which the elastic elements (26) are made from  
an elastic material with a low coefficient of friction.

5. Sensor according to claim 4, in which  
this elastic material is cellular  
10 polytetrafluoroethylene.

6. Sensor according to claim 1, in which  
the means of preventing buckling of the portion of  
optical wave guide comprise a single ring (24) that is  
fixed and integral with the housing and that guides the  
15 portion (12) of optical wave guide over the entire  
length of the sensor.

7. Sensor according to claim 1, in which  
the means (62) of preventing buckling of the portion of  
optical wave guide comprise rigid washers (64) arranged  
20 one after the other in the housing, along the portion  
of optical wave guide, this portion of optical wave  
guide passing through them, together with elastic  
elements (66) that are arranged one after the other in  
the housing, between this housing and the membrane,  
25 alternate with the rigid washers, and are integral with  
these rigid washers.

8. Sensor according to claim 7, in which  
the elastic elements (66) form a single block of  
elastic material that traps the portion of optical wave  
30 guide.